

Taxonomic Studies of the Japanese Formicidae, Part 4. Three New Species of Ponerinae

Mamoru TERAYAMA*

Laboratory of Applied Entomology, Faculty of Agriculture, The University
of Tokyo, 1-1-1, Yayoi, Bunkyo-ku, Tokyo, 113-0032 Japan

Abstract. Three new species are described and illustrated from Japan:
Cryptopone tengu, *Pachycondyla sakishimensis* and *Hypoponera beppin*.

In this paper I describe 3 species belonging to the subfamily Ponerinae from Japan. The holotypes are preserved in the collection of the Museum Nature and Human Activities, Sanda, Hyogo, Japan. Measurements and indices used in the paper followed those in the part 1 of this series.

Genus *Cryptopone* EMERY

[Japanese name: Mekura-hari-ari-zoku]

Cryptopone EMERY, 1893, *Bull. Bimensuel. Soc. Ent. Fr.*, 1892 (20): 275.

Type species: *Cryptopone testacea* EMERY, 1893.

Diagnosis. Small to Medium-sized ponerine ants. Body color yellow to blackish brown. Eye small to absent. Palpal formula 2 : 2 or less. Mandible with a small pit near its base, on the outer surface. Outer portion of middle tibia with many stout setae. Middle and hind tibiae each with 2 spurs, one pectinate, the other spinose.

Remarks. *Cryptopone* is distributed in tropical and subtropical Asia (around 11 species) and North America (1 species). It is represented by 2 species in Japan, one of which is nomenclaturally undetermined and is described herein.

Japanese species. *C. sauteri* (WHEELER), *C. tengu* sp. nov.

* Correspondence: M. TERAYAMA, c/o MATSUMOTO's Laboratory, Department of Biology, The University of Tokyo, Komaba, Meguro-ku, Tokyo, 153-8902 Japan

Cryptopone tengu sp. nov.

[Japanese name: Hanadaka-mekura-hari-ari]

(Figs. 1-5)

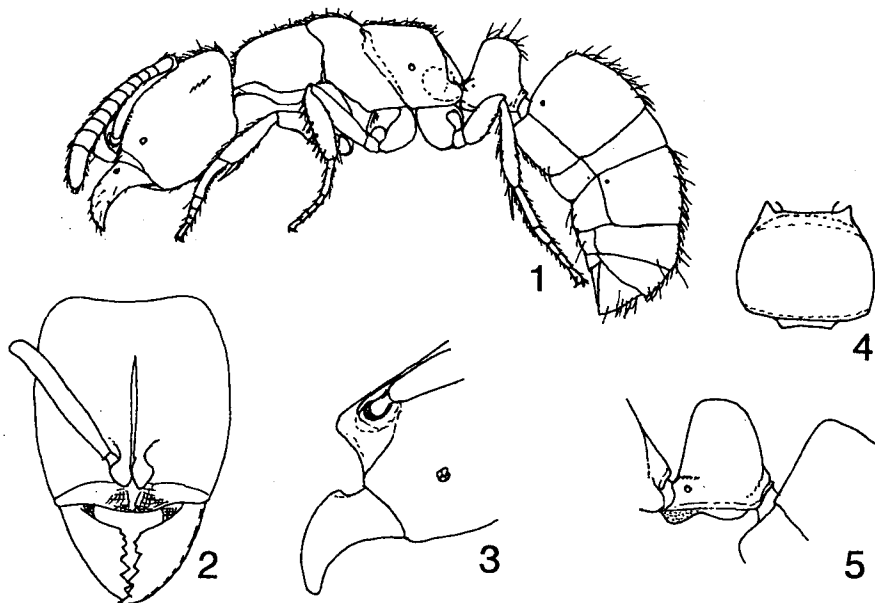
Cryptopone sp.: ONOYAMA, 1976, In IKEHARA (ed.), *Ecological Studies of Nature Conservation of the Ryukyu Islands - (II)*: 124.

Cryptopone sp. 2: TERAYAMA & ONOYAMA, 1989, In MRYMECOL. SOC. JAPAN (ed.), *A Guide for the Identification to the Japanese Ants, (I)*: 21.

Diagnosis. Total length of workers around 3.5-4 mm. Body color yellowish brown to reddish brown. Mandible with 8 teeth, the apical 4 larger than the others. Dorsal outline of clypeus distinctly produced, forming a right angle in profile. Petiolar node thick; subpetiolar process present on anterior portion, forming a small rounded projection; the remaining ventral margin of petiole straight.

Description of Holotype. Worker. HL 0.85 mm; HW 0.73 mm; SL 0.53 mm; CI 85; SI 72; WL 1.23 mm; PW 0.55 mm; PNL 0.33 mm; PH 0.48 mm; DPW 0.40 mm; TL 3.6 mm.

Head rectangular, with parallel sides and slightly concave posterior margin in full face view. Mandible with 8 teeth; apical 4 larger than the others. Dorsal outline of clypeus distinctly produced, forming a right



Figs. 1-5. *Cryptopone tengu* sp. nov., worker — 1, Body, profile; 2, head, full face view; 3, clypeus, profile; 4, petiole, dorsal view; 5, ditto, profile.

angle in profile; anterior clypeal margin moderately convex. Antennal scape not reaching posterior margin of head in full face view. Eye small, consisting of several indistinct facets.

Dorsal outline largely straight; posterodorsal corner of propodeum forming a dull angle. Petiolar node thick; 0.7 times as long as high, with weakly convex dorsal margin in profile; node in dorsal view 0.6 times as long as wide. Subpetiolar process present on anterior portion, forming a small rounded projection; the remaining ventral margin of petiole straight.

Head, mesosoma, and petiole microreticulate; gaster very weakly microreticulate and subopaque.

Abundant golden pubescences present on head, mesosoma, dorsum of petiolar node, and gaster. Erect or suberect hairs also present on dorsa of head, mesosoma, petiolar node, and gaster.

Body reddish brown; mandible, antenna, and legs yellowish brown.

Holotype. Worker, Amami-oshima, Kagoshima Pref., 26. III. 1980, M. TETAYAMA leg.

Paratypes. 5 workers, same data as holotype; 8 workers, Kunigami-son, Okinawa-jima, Okinawa Pref., 21. VIII. 1991, M. TERAYAMA leg.

Distribution. Nansei Is. (Amami-oshima I. and southwards), Ogasawara Is.

Remarks. This species resembles *C. sauteri* (WHEELER), but is easily distinguished by the configuration of the clypeus, petiolar node, and subpetiolar process. It is distributed on Amami-oshima Island and southwards of the Nansei Islands, and Haha-jima Island of the Ogasawara Islands (TERAYAMA & ONOYAMA, 1989; TERAYAMA & HASEGAWA, 1992), and nests in the leaf litter layer and soil in forests. Relatively common in the Nansei Islands.

Genus *Pachycondyla* Fr. SMITH

[Japanese name: Oo-hari-ari-zoku]

Pachycondyla Fr. SMITH, 1858, *Cat. Hym. Ins. Coll. Br. Mus.*, 6. Formicidae: 105.

Type species: *Formica crassinoda* EMERY, 1901.

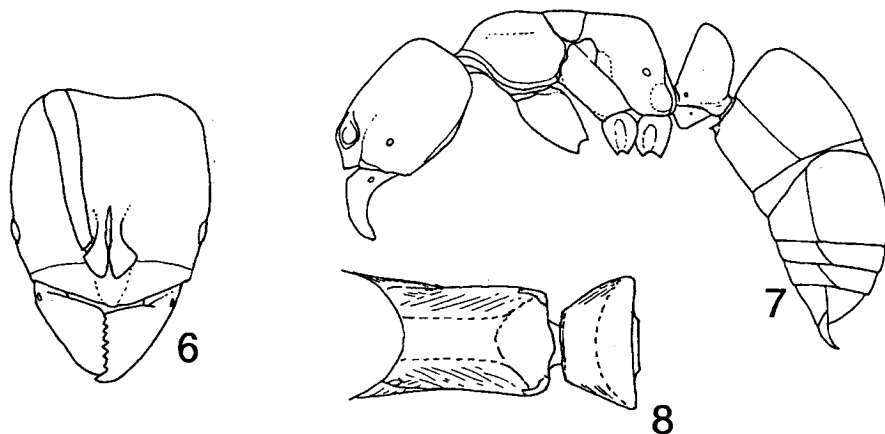
For full synonymy see BOLTON (1995b).

Diagnosis. Ponerine ants of moderate to large size. Head in full face view with horizontal frontal lobes; the lobes closely approximated or even partially to entirely confluent. Eye various in size. Mandible subtriangular, usually with 7 or more teeth (rarely with 6); in some species mandible has a small oval pit near its base. Mesosoma usually with

the dorsum flat in profile. Petiole with a free posterior face, without dorsal spines. Middle and hind legs each with two spurs, one spine-like, the other pectinate; the former at least as long as the $1/3$ length of the latter; tarsal claws of hind leg simple, not pectinate. Middle tibia lacking stout setae on its outer surfaces.

Remarks. Genus *Pachycondyla* Fr. SMITH is distributed widely around the world excluding the Nearctic region. It includes around 200 nominal species, the species-level taxonomy of which is generally unresolved. BROWN (1973) suggested informally that the genera *Ectomomyrmex* EMERY, *Trachymesopus* EMERY, *Bothroponera* MAYR, *Pseudoneoponera* DONISTHORPE, *Eumecopone* FOREL, *Mesoponera* EMERY, *Xiphopelta* FOREL, *Neoponera* EMERY, *Preadoponera* EMERY, *Termitopone* WHEELER, *Syntermitopone* WHEELER, and *Wadeura* WEBER should be synonymized under *Pachycondyla* Fr. SMITH. SNELLING (1981) also provisionally synonymized the genus *Brachyponera* EMERY with the genus *Pachycondyla*. Recently, BOLTON (1995b) formally synonymized those genera with *Pachycondyla*.

Japanese species. *P. chinensis* (EMERY), *P. darwinii* (FOREL), *P. javana* MAYR, *P. pilosior* (WHEELER), *P. sakishimensis* sp. nov., *P. sp.* (= *Brachyponera* sp. 2, sensu OGATA, 1989)



Figs. 6-8. *Pachycondyla sakishimensis* sp. nov., worker — 6, Head, full face view; 7, body, profile; 8, propodeum and petiole, dorsal view.

***Pachycondyla sakishimensis* sp. nov.**
 [Japanese name: Aka-kebuka-hari-ari]
 (Figs. 6-8)

Trachymesopus sp.: ONOYAMA, 1976, In IKEHARA (ed.), *Ecological Studies of Nature Conservation of the Ryukyu Islands - (II)*: 124.

Trachymesopus sp. 3: TERAYAMA & MORISITA, 1989, In MYRMECOL. SOC. JAPAN (ed.), *A Guide for the Identification to the Japanese Ants, (I)*: 20.

Diagnosis. Total length of workers around 4.5-5 mm. Mandible with a basal pit. General shape and body size close to *P. pilosior* (WHEELER), but the color generally lighter. Subpetiolar process triangular. The latter is the major feature distinguishing this species from *P. pilosior*.

Description of Holotype. Worker. HL 0.78 mm; HW 0.75 mm; SL 0.58 mm; CI 97; SI 77; WL 1.18 mm; PW 0.70 mm; PNL 0.24 mm; PH 0.60 mm; DPW 0.58 mm; TL 4.5 mm.

Head almost square in frontal view, slightly longer than wide, with almost straight posterior margin in full face view. Mandible with a small pit at near base. Antennal scape just reaching posterior margin of head. Eye small, with about 10 facets.

Dorsal outline of mesosoma largely straight; posterodorsal corner forming an obtuse angle in profile; dorsal disc of propodeum 1.5 times as long as wide. Petiolar node thin and high; anterior and posterior margins converging to dorsum; dorsal outline acutely convex; width of node in dorsal view 0.9 times dorsal width of pronotum. Subpetiolar process triangular, with a ventral corner.

Head, mesosoma and gaster strongly microreticulate; petiole, antennal scape and legs moderately microreticulate.

Head, mesosoma, petiole and gaster covered with abundant whitish pubescences. Dorsal of head, mesosoma, petiole, and gaster with moderate erect hairs; the hairs also present on antennal scape.

Head blackish brown; mesosoma, petiole and gaster dark reddish brown; antenna, mandible and legs reddish brown.

Holotype. Worker, Urauchi, Iriomote-jima, Okinawa Pref., 30. III. 1985, M. TERAYAMA leg.

Paratypes. 3 workers, same data as holotype; 3 workers, Ohara, Iriomote-jima, Okinawa Pref., 17. III. 1978, M. TERAYAMA leg.; 5 workers, Mt. Omoto-dake, Ishigaki-jima, Okinawa Pref., 13. VIII. 1978, M. TERAYAMA leg.; 1 worker, Taketomi-jima, Okinawa Pref., 29. VII. 1977, M. TERAYAMA leg.

Distribution. Nansei Is. (Miyako I. and the Yaeyama Is.).

Remarks. This species especially resembles *P. pilosior* (WHEELER), but is separated by the shape of subpetiolar process. The species nests in soil. Single foraging workers are often observed on the ground at forest margins.

Genus *Hypoponera* SANTSCHI
[Japanese name: Nise-hari-ari-zoku]

Hypoponera SANTSCHI, 1938, *Bull. Soc. Ent. Fr.*, 43: 79.

Type species: *Ponera abeillei* André, 1881 [As subgenus of *Ponera*.]

Hypoconera: TAYLOR, 1967, *Pac. Ins. Mon.*, 13: 9 [Raised to genus status.]

Diagnosis. Small, yellow brown to blackish brown ants. Eye reduced. Mandible with 3 or 4 apical teeth, followed by several small denticles. No small pit on dorsolateral surface of mandibular base. Middle and hind tibiae each with a single pectinate spur. No stout setae on outer surfaces of middle tibia. Similar to *Ponera*, but differing in the form of the subpetiolar process, which is a simple lobe. The subpetiolar process in *Hypoconera* lacks the anterior translucent fenestra (or window) and bilaterally paired small teeth which essentially characterize *Ponera*. Palpal formula 1:1 or 1:2. Larvae with two pairs of mushroom-like projections dorsally on the abdomen.

Remarks. *Hypoconera* species nest under stones, under and in decaying logs and other fallen wood and in the soil. Several have ergatoid males. About 130 species are known (BOLTON, 1995a). The genus is widespread, mainly in tropical and subtropical zones. Eight Japanese species are recognized: 7 named and one nomenclaturally undetermined which is described herein.

Japanese species. *H. beppin* sp. nov., *H. bondroiti* (FOREL), *H. gleadowi* (FOREL), *H. nippona* ONOYAMA, *H. nubatama* TERAYAMA & HASHIMOTO, *H. opaciceps* (MAYR), *H. sauteri* (FOREL), *H. zwaluwenburgi* (WHEELER).

***Hypoconera beppin* sp. nov.**
[Japanese name: Beppin-nise-hari-ari]
(Figs. 9-11)

Hypoconera? sp. C: ONOYAMA, 1976, In IKEHARA (ed.), *Ecological Studies of Nature Conservation of the Ryukyu Islands - (II)*: 124.

Hypoconera sp. 6: ONOYAMA & TERAYAMA, 1989, In MYRMECOL. SOC. JAPAN (ed.), *A Guide for the Identification to the Japanese Ants, (I)*: 27.

Diagnosis. Total length of workers around 3 mm. Body color brown to blackish brown. Eye with a single black facet; the distance from the posterior margin of clypeus to the anterior margin of eye 4-5 times the

eye diameter. Antennal club 6-segmented, the 6th segment from the apex indistinctly swollen. Metanotum slightly constricted. Lateral border of propodeal declivity angulate. Petiole narrow in posterior view; its dorsal surface slightly pointed. Subpetiolar process subtriangular.

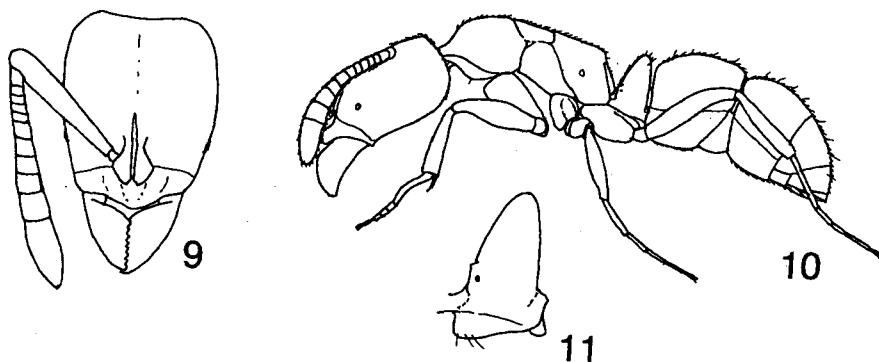
Description of holotype. Worker. HL 0.70 mm; HW 0.53 mm; SL 0.50 mm; CI 75; SI 95; WL 0.92 mm; PW 0.45 mm; PNL 0.18 mm; PH 0.40 mm; DPW 0.24 mm; TL 3.0 mm.

Head long, 1.32 times as long as wide, with gently convex sides and almost straight posterior margin in full face view. Antenna with 12 segments; scape long, exceeding posterior margin of head; 2nd segment 1.3 times as long as wide; 3rd to 11th segments each wider than long; 11th segment 1.3 times as long as wide; terminal segment 2.1 times as long as wide; antennal club 6-segmented, the 6th segment from the apex indistinctly swollen. Eye with a single black facet; the distance from the posterior margin of clypeus to the anterior margin of eye 4-5 times the eye diameter.

Mesosoma moderately long, dorsum of mesonotum and propodeum straight; metanotum slightly constricted; propodeal declivity gently sloping; lateral margin of propodeal declivity angulate. Petiole high, with gently convex anterior and straight posterior margins; dorsal margin strongly convex in profile; dorsal disc in frontal view strongly convex. Subpetiolar process subtriangular, with an anteroventral corner.

Head microreticulate; mesosoma, petiole, and gaster relatively weakly microreticulate.

Body color reddish brown; mandible, antenna, and legs yellowish brown.



Figs. 9-11. *Hypoponera beppin* sp. nov., worker — 9, Head, full face view; 10, body, profile; 11, petiole, profile.

Holotype. Worker, Kunigami-son, Okinawa-jima, Okinawa Pref., 25. VIII. 1991, M. TERAYAMA leg.

Paratypes. 5 workers, same data as holotype; 3 workers, Mt.

Yonaha-dake, Okinawa-jima, Okinawa Pref., 11. III. 1983, H. TAKAMINE leg.

Distribution. Honshu (Mie Pref.), Kyushu, Nansei Is. (Amami-oshima I., Okinawa I.); Taiwan.

Remarks. This new species is distinguished from the other Japanese congeners by the 6-segmented antennal club (5-segmented in other Japanese species). This species nests in the soil.

Acknowledgements

I thank Dr. K. ONOYAMA (Obihiro Univ. Agri. & Veter. Med.) and Mr. H. TAKAMINE (Naha-shi) for valuable materials, useful information and suggestions. Thanks are also due to Dr. R. W. TAYLOR (CSIRO) for partly improving the manuscript.

References

- BOLTON, B., 1995a. A taxonomic and zoogeographical census of the extant ant taxa (Hymenoptera: Formicidae). *Jour. Nat. Hist.*, **29**: 1037-1056.
- BOLTON, B., 1995b. *A New General Catalogue of the Ants of the World*, 504 pp. Harvard Univ. Press.
- BROWN, W. L. Jr., 1973. A comparison of the Hylean and Congo-West African rain forest ant faunas. In B. J. MEGGERS et al., (eds.), *Tropical Forest Ecosystems in Africa and South America: A Comparative Review*. pp. 161-185. Smithsonian Inst. Press, Washington, D. C.
- EMERY, C., 1893. Untitled contribution introduced by, "M. C. EMERY, de Bologne, envoie les de cinq nouveaux genres de Formicides." *Bull. Bimensuel Soc. Ent. Fr.*, 1892, (20): 275-277. (Indirectly cited.)
- OGATA, K. 1989. Genus *Brachyponera*. In MYRMECOLOGICAL SOCIETY of JAPAN (ed.), *A Guide for the Identification of Japanese Ants (I). Ponerinae, Cerapachyinae, Pseudomyrmecinae, Dorylinae and Leptanillinae (Hymenoptera: Formicidae)*, p. 19. The Myrmecological Society of Japan. (In Japanese.)
- ONOYAMA, K., 1976. A preliminary study on the ant fauna of Okinawa-Ken, with taxonomic notes (Japan; Hymenoptera: Formicidae). In. IKEHARA, S. (ed.), *Ecological Studies of Nature Conservation of the Ryukyu Islands - (II)*, pp. 121-141. University of Ryukyus, Naha.
- ONOYAMA, K. & M. TERAYAMA, 1989. Genus *Hypoconera*. In MYRMECOLOGICAL SOCIETY of JAPAN (ed.), *A Guide for the Identification of Japanese Ants (I). Ponerinae, Cerapachyinae, Pseudomyrmecinae, Dorylinae and Leptanillinae (Hymenoptera: Formicidae)*, pp. 25-27. The Myrmecological Society of Japan,

- Tokyo. (In Japanese.)
- SANTSCHI, F., 1938. Notes sur quelques *Ponera*. *Bull. Soc. Ent. Fr.* 43: 78-80.
- SMITH, Fr., 1858. *Catalogue Hymenopterous Insects in the Collection of the British Museum* 6, *Formicidae*: 216 pp. London. (Indirectly cited.)
- SNELLING, R., 1981. Systematics of social Hymenoptera. In HERMANN, H. R. (ed.), *Social Insects* 2: pp. 369-453. New York.
- TAYLOR, R. W., 1967. A monographic revision of the ant genus *Ponera* LATREILLE (Hymenoptera: Formicidae). *Pac. Ins. Mon.*, 13: 1-112.
- TERAYAMA, M. & E. HASEGAWA, 1992. Ants of the Ogasawara Islands. *Ann. Rep. Ogasawara Res.* (Tokyo Matropolitan Univ.), 15: 40-51. (In Japanese.)
- TERAYAMA, M. & M. MORISITA, 1989. Genus *Trachymesopus*. In MYRMECOLOGICAL SOCIETY OF JAPAN (ed.), *A Guide for the Identification of Japanese Ants (I). Ponerinae, Cerapachyinae, Pseudomyrmecinae, Dorylinae and Leptanillinae* (Hymenoptera: Formicidae), p. 20. The Myrmecological Society of Japan, Tokyo. (In Japanese.)
- TERAYAMA, M. & K. ONOYAMA, 1989. Genus *Cryptopone*. In MYRMECOLOGICAL SOCIETY OF JAPAN (ed.), *A Guide for the Identification of Japanese Ants (I). Ponerinae, Cerapachyinae, Pseudomyrmecinae, Dorylinae and Leptanillinae* (Hymenoptera: Formicidae), p. 21. The Myrmecological Society of Japan, Tokyo. (In Japanese.)

